

**2.29 New Kraft Pulp Mills**

2.29.1 Applicability and Designation of Affected Facility

- (a) The provisions of this source category are applicable to the following affected facilities in kraft pulp mills: Digester system, brown stock washer system, multiple-effect evaporator system, recovery furnace, smelt dissolving tank, lime kiln, and condensate stripper system. In pulp mills where kraft pulping is combined with neutral sulfite semichemical pulping, the provisions of this source category are applicable when any portion of the material charged to an affected facility is produced by the kraft pulping operation.
- (b) Except as noted in §60.283(a)(1)(iv)\*, any facility under paragraph (a) of this section that commences construction or modification after September 24, 1976, is subject to the requirements of this source category.

2.29.2 Test Methods and Procedures

- (a) In conducting the performance tests required in Section 1.2, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of this text or other methods and procedures in this section, except as provided in Section 1.2(b). Acceptable alternative methods and procedures are given in paragraph (f) of this section.
- (b) The owner or operator shall determine compliance with the particulate matter standards in §60.282(a) (1) and (3)\* as follows:
  - (1) Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Water shall be used as the cleanup solvent instead of acetone in the sample recovery procedure. The particulate concentration shall be corrected to the appropriate oxygen concentration according to Section 2.29.3(c)(3).
  - (2) The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the oxygen concentration. The gas sample shall be taken at the same time and at the same traverse points as the particulate sample.
  - (3) Method 9 and the procedures in Section 1.3 shall be used to determine opacity.
- (c) The owner or operator shall determine compliance with the particulate matter standard in §60.282(a)(2)\* as follows:
  - (1) The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = C_s Q_{sd} / BLS$$

Where:

- E = emission rate of particulate matter, g/kg (lb/ton) of BLS.
- C<sub>s</sub> = concentration of particulate matter, g/dsm (lb/dscf).
- Q<sub>sd</sub> = volumetric flow rate of effluent gas, dscm/hr (dscf/hr).
- BLS = black liquor solids (dry weight) feed rate, kg/hr (ton/hr).

- (2) Method 5 shall be used to determine the particulate matter concentration (C<sub>s</sub>) and the volumetric flow rate (Q<sub>sd</sub>) of the effluent gas. The sampling time and sample volume shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Water shall be used instead of acetone in the sample recovery.
- (3) Process data shall be used to determine the black liquor solids (BLS) feed rate on a dry weight basis.

(d) The owner or operator shall determine compliance with the TRS standards in §60.283\*, except §60.283(a)(1)(vi) and (4), as follows:

- (1) Method 16 shall be used to determine the TRS concentration. The TRS concentration shall be corrected to the appropriate oxygen concentration using the procedure in Section 2.29.3. The sampling time shall be at least 3 hours, but no longer than 6 hours.
- (2) The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the oxygen concentration. The sample shall be taken over the same time period as the TRS samples.
- (3) When determining whether a furnace is a straight kraft recovery furnace or a cross recovery furnace, TAPPI Method T.624 (incorporated by reference -- see Section 1.6) shall be used to determine sodium sulfide, sodium hydroxide, and sodium carbonate. These determinations shall be made 3 times daily from the green liquor, and the daily average values shall be converted to sodium oxide (Na<sub>2</sub>O) and substituted into the following equation to determine the green liquor sulfidity:

$$GLS = 100 C_{Na_2S} / (C_{Na_2S} + C_{NaOH} + C_{Na_2CO_3})$$

GLS = green liquor sulfidity, percent.

C<sub>Na<sub>2</sub>S</sub> = concentration of Na<sub>2</sub>S as Na<sub>2</sub>O, mg/liter (gr/gal).

C<sub>NaOH</sub> = concentration of NaOH as Na<sub>2</sub>O, mg/liter (gr/gal).

C<sub>Na<sub>2</sub>CO<sub>3</sub></sub> = concentration of Na<sub>2</sub>CO<sub>3</sub> as Na<sub>2</sub>O, mg/liter (gr/gal).

(e) The owner or operator shall determine compliance with the TRS standards in §60.283(a)(1)(vi) and (4)\* as follows:

- (1) The emission rate (E) of TRS shall be computed for each run using the following equation:

$$E = C_{TRS} F Q_{sd} / P$$

Where:

E = emission rate of TRS, g/kg (lb/ton) of BLS or ADP.

C<sub>TRS</sub> = average combined concentration of TRS, ppm.

F = conversion factor, 0.001417 g H<sub>2</sub>S/m<sup>3</sup> ppm (0.08844 x 10<sup>-6</sup> lb H<sub>2</sub>S/ft<sup>3</sup> ppm).

Q<sub>sd</sub> = volumetric flow rate of stack gas, dscm/hr (dscf/hr).

P = black liquor solids feed or pulp production rate, kg/hr (ton/hr).

- (2) Method 16 shall be used to determine the TRS concentration (C<sub>TRS</sub>).
- (3) Method 2 shall be used to determine the volumetric flow rate (Q<sub>sd</sub>) of the effluent gas.
- (4) Process data shall be used to determine the black liquor feed rate or the pulp production rate (P).

(f) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this section:

- (1) For Method 5, Method 17 may be used if a constant value of 0.009 g/dscm (0.004 gr/dscf) is added to the results of Method 17 and the stack temperature is no greater than 205 °C (400 °F).

- (2) For Method 16, Method 16A or 16B may be used if the sampling time is 60 minutes.

2.29.3 Monitoring of Emissions and Operations

- (a) Any owner or operator subject to the provisions of this source category shall, where required, install, calibrate, maintain, and operate the following continuous monitoring systems:
- (1) A continuous monitoring system to monitor and record the opacity of the gases discharged into the atmosphere from any recovery furnace. The span of this system shall be set at 80 percent opacity.
  - (2) Continuous monitoring systems to monitor and record the concentration of TRS emissions on a dry basis and the percent of oxygen by volume on a dry basis in the gases discharged into the atmosphere from any lime kiln, recovery furnace, digester system, brown stock washer system, multiple-effect evaporator system, or condensate stripper system, except where the provisions of §60.283(a)(1)(iii) or (iv)\* apply. These systems shall be located downstream of the control device(s) and the spans of these continuous monitoring system(s) shall be set:
    - (i) At a TRS concentration of 30 ppm for the TRS continuous monitoring system, except that for any cross recovery furnace the span shall be set at 50 ppm.
    - (ii) At 20 percent oxygen for the continuous oxygen monitoring system.
- (b) Any owner or operator subject to the provisions of this source category shall, where required, install, calibrate, maintain, and operate the following continuous monitoring devices:
- (1) For any incinerator, a monitoring device which measures and records the combustion temperature at the point of incineration of effluent gases which are emitted from any digester system, brown stock washer system, multiple-effect evaporator system, black liquor oxidation system, or condensate stripper system where the provisions of §60.283(a)(1)(iii)\* apply. The monitoring device is to be certified by the manufacturer to be accurate within  $\pm 1$  percent of the temperature being measured.
  - (2) For any lime kiln or smelt dissolving tank using a scrubber emission control device:
    - (i) A monitoring device for the continuous measurement of the pressure loss of the gas stream through the control equipment. The monitoring device is to be certified by the manufacturer to be accurate to within a gauge pressure of  $\pm 500$  pascals (ca.  $\pm 2$  inches water gauge pressure).
    - (ii) A monitoring device for the continuous measurement of the scrubbing liquid supply pressure and/or flow rate subject to Division approval, to the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within  $\pm 15$  percent of design scrubbing liquid supply pressure. The pressure sensor or tap is to be located close to the scrubber liquid discharge point. The Director may be consulted for approval of alternative locations.
    - (iii) A monitoring device for the continuous measurement of the weak wash flow rate and weak wash pump pressure (if weak wash is the only scrubbing liquid). The monitoring devices are to be certified by the manufacturer to be accurate as follows: for weak wash flow rate,  $\pm 5$  percent of the design scrubbing liquid flow rate, and for pump pressure,  $\pm 15$  percent of the normal operating pump pressure.
- (c) Any owner or operator subject to the provisions of this source category shall, where required:
- (1) Calculate and record on a daily basis 12-hour average TRS concentrations for the two consecutive periods of each operating day. Each 12-hour average shall be determined as the arithmetic mean of the appropriate 12 contiguous 1-hour average total reduced sulfur concentrations provided by each continuous monitoring system installed under paragraph (a)(2) of this section.

- (2) Calculate and record on a daily basis 12-hour average oxygen concentrations for the two consecutive periods of each operating day for the recovery furnace and lime kiln. These 12-hour averages shall correspond to the 12-hour average TRS concentrations under paragraph (c)(1) of this section and shall be determined as an arithmetic mean of the appropriate 12 contiguous 1-hour average oxygen concentrations provided by each continuous monitoring system installed under paragraph (a)(2) of this section.
- (3) Correct all 12-hour average TRS concentrations to 10 volume percent oxygen, except that all 12-hour average TRS concentrations from a recovery furnace shall be corrected to 8 volume percent using the following equation:

$$C_{corr} = C_{meas} \times (21 - X/21 - Y)$$

Where:

$C_{corr}$  = the concentration corrected for oxygen

$C_{meas}$  = the concentration uncorrected for oxygen

X = the volumetric oxygen concentration in percentage to be corrected to (8 percent for recovery furnaces and 10 percent for lime kilns, incinerators, or other devices)

Y = the measured 12-hour average volumetric oxygen concentration

- (4) Record once per shift measurements obtained from the continuous monitoring devices installed under paragraph (b)(2) of this section.
- (d) For the purpose of reports required under Section 1.5, any owner or operator subject to the provisions of this source category shall report semi-annually, or as otherwise required, periods of excess emissions as follows:
- (1) For emissions from any recovery furnace, periods of excess emissions are:
    - (i) All 12-hour averages of TRS concentrations above 5 ppm by volume for straight kraft recovery furnaces and above 25 ppm by volume for cross recovery furnaces.
    - (ii) All 6-minute average opacities that exceed 35 percent.
  - (2) For emissions from any lime kiln, periods of excess emissions are all 12-hour average TRS concentrations above 8 ppm by volume.
  - (3) For emissions from any digester system, brown stock washer system, multiple-effect evaporator system, or condensate stripper system periods of excess emissions are:
    - (i) All 12-hour average TRS concentrations above 5 ppm by volume where required.
    - (ii) All periods in excess of 5 minutes and their duration during which the combustion temperature at the point of incineration is less than 1200°F, where the provisions of §60.283(a)(1)(iii)\* apply.
- (e) The Director will not consider periods of excess emissions reported under paragraph (d) of this section to be indicative of a violation provided that:
- (1) The percent of the total number of possible contiguous periods of excess emissions in a quarter (excluding periods of startup, shutdown, or malfunction and periods when the facility is not operating) during which excess emissions occur does not exceed:
    - (i) One percent for TRS emissions from recovery furnaces.
    - (ii) Six percent for average opacities from recovery furnaces.

- (2) The Director determines that the affected facility, including air pollution control equipment, is maintained and operated in a manner which is consistent with good air pollution control practice for minimizing emissions during periods of excess emissions.

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\*Code of Federal Regulations, Title 40 Part 60.